

**REMARKS****Rejection under 35 U.S.C. § 101**

The Examiner has rejected claim 37 under 35 U.S.C. § 101 for being directed to non-statutory subject matter stating that it is unknown how the algorithm “learns.” Office Action, page 3.

In the previous amendment, dated January 6, 2004, the “remarks” section mentioned an amendment to claim 37. However, Applicant’s attorney inadvertently omitted amending the claim language. In the present amendment, claim 37 has been amended to recite “storing patterns of current levels to support a computational learning algorithm, said computational learning algorithm repetitively refining control coefficients in response to said stored patterns of current levels, wherein said adjusting is performed using said control coefficients from said computational learning algorithm.”

As discussed in paragraph [0056] of the specification, computational learning algorithms involve providing training examples to generate a set of weights or coefficients. The coefficients are used to generate result data. The result data is then used to refine the set of coefficients. The claimed subject matter uses a computational learning algorithm in a novel and nonobvious manner. Applicant respectfully submits that claim 37 satisfies all requirements of 35 U.S.C. § 101.

**Rejection under 35 U.S.C. § 102(e)**

Claims 26, 33-39, 40, 42, 43, and 46-49 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,570,704 to Palese (hereinafter referred to as Palese).

It is well settled that to anticipate a claim, the reference must teach every element of the claim. See MPEP § 2131. Moreover, in order for a reference to be anticipatory under 35 U.S.C. § 102 with respect to a claim, “[t]he elements must be arranged as required by the claim.” See MPEP § 2131, citing *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990). Furthermore, in order for a reference to be anticipatory under 35 U.S.C. § 102 with respect to a claim, “[t]he identical invention must be shown in as complete detail as is contained in the . . . claim.” See MPEP § 2131, citing *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913 (Fed.

Cir. 1989). Applicant respectfully submits that the applied reference does not satisfy these requirements.

Claim 26 is directed to a method for providing a dynamically spectrally tailored Raman pump, said Raman pump generating Raman gain for a plurality of signal wavelengths. The method comprises:

- driving a plurality of gain elements utilizing a plurality of current sources, each current source of said plurality of current sources driving at least one gain element of said plurality of gain elements by a variable current, wherein each of said plurality of gain elements generates a spectrally distinct output;
- combining outputs from said plurality of gain elements to generate said Raman pump that comprises a plurality of spectral components;
- providing said Raman pump to an optical medium to generate Raman gain for said plurality of signal wavelengths;
- determining power levels associated with said plurality of signal wavelengths; and
- adjusting variable currents of said plurality of current sources utilizing in part said power levels associated with said plurality of signal wavelengths wherein said adjusting causes dynamic spectral tailoring of said Raman pump.

Claim 39 is directed to a system for providing Raman gain to a plurality of signal wavelengths. The system comprises:

- a plurality of gain elements producing output beams;
- a collimating optic focusing said output beams on a dispersive element;
- said dispersive element combining said output beams as a Raman pump that comprises a plurality of spectral components;
- a Raman amplifier receiving said Raman pump for amplifying said plurality of signal wavelengths; and
- a controller device causing said plurality of gain elements to operate at variable power levels in response to received information indicative of Raman gain produced by said Raman pump on said plurality of signal wavelengths, wherein operation of said plurality of gain elements at variable power levels cause dynamic spectral tailoring of said Raman pump.

A pump for an optical amplifier refers to optical power provided to an optical gain medium (e.g., an optical fiber) that excites the gain medium to cause optical gain. A Raman pump is a pump provided to a Raman amplifier. In claims 26 and 39, the Raman pump comprises multiple spectral components. Also, a plurality of signal wavelengths are amplified by the Raman amplifier that receives the recited Raman pump. The Raman pump is dynamically spectrally tailored.

Palese is directed to a different type of system and a different operating method. Palese discloses a device for producing relatively high average power laser light. Specifically, the outputs from the multiple fiber amplifiers are combined to generate the high power laser light. Each fiber amplifier receives a pump from a single diode of a diode array (elements 18, 118, 218, and 318 as shown in FIGURES 1-4). The fiber amplifiers, in turn, amplify respective “seed wavelengths.” In some of the embodiments, the seed wavelengths being amplified are spectrally distinct due to the use of a dispersive element (see FIGURE 2).

The system of Palese does not combine outputs from multiple gain elements to generate an amplifier pump. Only one diode is used to generate a separate pump for each fiber. *See* elements 118 and 114 of FIGURE 2. Instead of combining pumps, the Palese system combines the amplified outputs from the fiber amplifiers (see element 134 of FIGURE 2). However, the combining occurs after the amplification has taken place. Accordingly, the amplified outputs are not amplifier pumps, because the amplified outputs do not excite a gain medium to generate optical gain.

Additionally, the mere fact that the power provided to diode array 118 is variable does not lead to the conclusion that dynamical spectral tailoring of an amplifier pump occurs in Palese. Specifically, because a single diode is coupled to a single fiber to provide a discrete pump for that fiber, variation in the power of the diode would not change the spectral characteristics of the pump provided to the fiber. Applicant further notes that there is no disclosure that wavelength characteristics of the individual diodes of diode array 118 vary in any manner. Accordingly, even if the outputs from multiple diodes of diode array 118 were combined, spectral tailoring of a pump would not occur. The only disclosure of varying wavelengths in Palese is the variation of the seed wavelengths. *See* col. 3, lines 30-33. However, the seed wavelengths are the wavelengths being amplified and are not “pumps” by definition.

Accordingly, Palese does not disclose each and every limitation of claims 26 and 39. Claims 33-38, 40, 42, 43, and 46-49 respectively depend from base claims 26 and 29 and, hence, inherit all limitations of their base claim. Accordingly, claims 26, 33-39, 40, 42, 43, and 46-49 are not anticipated by Palese.

Rejection under 35 U.S.C. § 103(a)

Claims 27-32, 41, 44, and 45 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Palese in view of U.S. Patent No. 6,456,756 to Mead et al. (hereinafter Mead).

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art cited must teach or suggest all the claim limitations. *See* MPEP § 2143. Applicant respectfully submits that the rejection does not satisfy these criteria.

Claims 27-32, 41, 44, and 45 respectively depend from independent claims 26 and 39 and, hence, inherit all limitations of their base claim. For the reasons discussed with respect to the rejection under 35 U.S.C. § 102(e), Palese does not teach or suggest each and every limitation of claims 26 and 39. Moreover, Mead does not teach or suggest dynamically spectrally tailoring a Raman pump in the manner recited by claims 26 and 39. Accordingly, the applied references (either alone or in combination) do not teach or suggest each and every limitation of claims 27-32, 41, 44, and 45.

Additionally, Applicant respectfully submits that the requisite motivation to combine has not been established. Specifically, the Examiner has stated that it would have been obvious to use the array arrangement of Mead in the Palese system to provide a single output beam having predetermined characteristics. There is no identification of which characteristics would be employed and why the characteristics would be beneficial in any way. Accordingly, the proffered motivation equates to a statement that the teachings of the two references could be combined. However, it is well settled that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the references also suggest the desirability of the combination. *See* MPEP § 2143.01, *citing In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990).

Because the applied references do not teach or suggest each and every limitation and the requisite motivation to combine or modify has not been established, Applicant submits

that a prima facie case of obviousness has not been established for claims 27-32, 41, 44, and 45.

Conclusion

In view of the above amendment, Applicant believes the pending application is in condition for allowance. Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 06-2380, under Order No. 60988/P002US/10103486 from which the undersigned is authorized to draw.

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Respectfully submitted,

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